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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/830,021

04/23/2004

Hiroyoshi Funato

R2184.0312/P312

7637

24998 7590 02/25/2009

DICKSTEIN SHAPIRO LLP  
1825 EYE STREET NW  
Washington, DC 20006-5403

EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

02/25/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<i>Office Action Summary</i>	Application No.	Applicant(s)	
	10/830,021	FUNATO ET AL.	
	Examiner	Art Unit	
	Martin J. Angebrannt	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12/15/08 & 11/11/08.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 6-62 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-62 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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1. The response by the applicant has been received and made of record. Responses to the arguments of the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 6,7,24,25,46-53 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwayama JP 60-035701, in view of Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579.

Kuwayama JP 60-035701 teaches a method for forming optical heads which are corrected for the wavelength difference between the recording conditions and the use in the optical head. (abstract). In figure 4a, an original holographic recording is made to form a hologram in layer 11. In figure 4b, this is contacted with a holographic recording medium bearing recording layer (21) through index matching fluid (22) and exposed using convergent light (39) to form an aberration corrected holographic element used in figure 4c. The use of a phase plate (9) in aberration correction is shown in figure 1, where both the object and reference beams pass through the phase plate. (the examiner has only had a spot, oral translation of this document, if the applicant has a translation made, the examiner would appreciate a copy with the subsequent response.)

Ouchida et al. JP 2000-030285 teaches with respect to with respect to figure 1a, a polarization hologram diffraction grating (12) which has the form illustrated in figure 1d, where it is divided into three parts which divides the beams so that it is incident upon the light receiving element illustrated in figure 1e, where these are arranged next to each other. [0017].

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Kuwayama et al. '158 teaches the formation of a computer generated hologram (CGH) has a master hologram (35), where the parallel light is focused onto the holographic recording layer to record a hologram (32), where the unnecessary light is blocked by mask (35). (5/15-7/24). The use of a phase plate (9) in aberration correction is shown in figure 1, where both the object and reference beams pass through the phase plate. (figures 1 and 2)

Sekine et al. '579 teach with respect to figure 1, a CGH plate with an array of element holograms (22), which is contacted with a photosensitive layer (32) and used in a contact copying process. [0071-0076].

It would have been obvious so one skilled in the art to modify the process taught by Kuwayama JP 60-035701 to duplicate other holograms which are part of optical heads, such as the diffractive holographic splitter (12) of Ouchida et al. JP 2000-030285 with a reasonable expectation of forming the desired holographic article, based upon the prior use of contact copying in the art to form multiple gratings simultaneously as taught by Kuwayama et al. '158. Further it would have been obvious to use CGH holograms as the master based upon the teachings of Kuwayama et al. '158 and Sekine et al. '579 evidencing the prior art usage of CGH holograms in contact copying processes and the use of a CGH master to record a optical head hologram by Kuwayama et al. '158.

Particularly in view of the copying process being old and well known, relevant case law is below.

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*In re Albertson*, 332 F.2d 379, 141 USPQ 730 (CCPA 1964) (Process of chemically reducing one novel, nonobvious material to obtain another novel, nonobvious material was claimed. The process was held obvious because the reduction reaction was old.); *In re Kanter*, 399 F.2d 249, 158 USPQ 331 (CCPA 1968) (Process of siliconizing a patentable base material to obtain a patentable product was claimed. Rejection based on prior art teaching the siliconizing process as applied to a different base material was upheld.); Cf.

The examiner notes that the diffractive optical heads meeting the claims limitations are known and therefore not novel. The examiner also points out that in Kuwayama JP 60-035701, the hologram is for an optical head, similar to that required by the claim, so only the holographic image in Kuwayama JP 60-035701 differs from that required by the claims, so there is a strong presumption that the process of Kuwayama JP 60-035701 could be used to record other diffractive head holograms.

With respect to the claims reciting the relief hologram, the examiner holds that volume holograms has some relief character related to the diffractive image and that while that contribution is minor (~4%), it is nevertheless present. The applicant fails to appreciate that the exposures illustrated in the Kuwayama et al references show the formation of focused holograms. The applicant should compare the cited figures in these references with figure 2 of the instant application, noting the focal points of each of the beams. The beams converge to these points and then subsequently diverge on their path to the holographic recording layer. The applicant also fails to appreciate that CGH stands for computer generated holograms, which are produced on the basis of calculations performed by a computer (see claim 7). From the prior art applied, it is clear that either computer generated (CGH) or conventionally formed, using two

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beam interference, can be used as masters in proximity/contact exposure processes. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It is clear that the formation of multiple grating patterns to form an optical head is found in Tsuji et al. , while the other references show how these multifaceted gratings may be duplicated using proximity/ contact copying. The use of the masking techniques to shield areas from exposure required to form these multifaceted gratings is illustrated in Kuwayama et al. '158 who shows the use of masking means between the original and the photosensitive layer into which the duplicate is to be made and one of ordinary skill in the art would recognize that to form different gratings in different areas, masking to prevent undesired exposure would have to be used. The applicant is also directed to the teachings of Watanabe et al '637. The Kuwayama JP 60-035701 shows in figure 4b a contact copy which is a duplicate of the master. The applicant fails to appreciate that within the art that an original and master hologram are terms used interchangeably to describe the hologram which is being duplicated. The claims do not preclude the copy being a modified copy of the master the media produced using the relay lenses as shown in figures 48-53 would be examples of modified copies as would be the holograms formed in the processes recited in claims 21 which describes the modification in the copies of Kuwayama et al. '158, Kuwayama JP 60-035701 and Kuwayama et al. JP 60-122982 which modify the beams to provide aberration correction. The arguments of the applicant also fails to appreciate that the use of contact copying by Sekine et al. '579 to form copies of multiple holograms serves to provide a reasonable expectation of success.

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The applicant's representative fails to appreciate that the cited figures of the instant specification show these prior to cleavage into individual elements and the final elements are of course oriented flat to the optical propagation through the optical head. Their relative orientation on the wafer does not seem to matter and the applicant has not shown that it is. The applicant's attention is also directed to figures 2a and 2b of Funato et al. '047 and figure 1d of Ouchida et al. JP 2000-030285 each of which show an arrangement of sub-gratings similar to those of figure 25a-d of the instant application. The only difference between the Ouchida et al. grating and that illustrated in the specification is the overall shape of the entire grating area, noting that the beams diffracted by each of these is incident upon two detection elements (PD(2)& PD(3) or b & c) which are separated by a third detection element used for knife edge focus detection (PD1 or a1 & a2) (see Ouchida et al. [0012]) . The applicant should consider MPEP 2144.04, sections I, IV( B ) and VI( C ) .

4. Claims 6-19,24,25,46-53 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwayama et al. JP 60-122982 , in view of Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579.

Kuwayama et al. JP 60-122982 teaches with respect to figure 8 a master hologram (10), which has been contacted with the holographic recording layer (50) and is exposed using light having a spherical wavefront (43) which focuses/converges at a point similar to the focal point of the desired hologram before diverging. (see pages 4). This process corrects for aberration. (abstract). (the examiner has only had a spot, oral translation of this document, if the applicant has a translation made, the examiner would appreciate a copy with the subsequent response.)

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It would have been obvious so one skilled in the art to modify the process taught by Kuwayama et al. JP 60-122982 to duplicate other holograms which are part of optical heads, such as the diffractive holographic splitter (12) of Ouchida et al. JP 2000-030285 with a reasonable expectation of forming the desired holographic article, based upon the prior use of contact copying in the art to form multiple gratings simultaneously as taught by Kuwayama et al. '158. Further it would have been obvious to use CGH holograms as the master based upon the teachings of Kuwayama et al. '158 and Sekine et al. '579 evidencing the prior art usage of CGH holograms in contact copying processes and the use of a CGH master to record a optical head hologram by Kuwayama et al. '158.

Particularly in view of the copying process being old and well known, relevant case law is below.

*In re Albertson*, 332 F.2d 379, 141 USPQ 730 (CCPA 1964) (Process of chemically reducing one novel, nonobvious material to obtain another novel, nonobvious material was claimed. The process was held obvious because the reduction reaction was old.); *In re Kanter*, 399 F.2d 249, 158 USPQ 331 (CCPA 1968) (Process of siliconizing a patentable base material to obtain a patentable product was claimed. Rejection based on prior art teaching the siliconizing process as applied to a different base material was upheld.); Cf.

The examiner notes that the diffractive optical heads meeting the claims limitations are known and therefore not novel. The examiner also points out that in Kuwayama et al. JP 60-122982, the hologram is for an optical head, similar to that required by the claim, so only the holographic image in Kuwayama et al. JP 60-122982 differs from that required by the claims, so there is a



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strong presumption that the process of Kuwayama et al. JP 60-122982 could be used to record other diffractive head holograms.

With respect to the claims reciting the relief hologram, the examiner holds that volume holograms has some relief character related to the diffractive image and that while that contribution is minor (~4%), it is nevertheless present.

The rejection stands for the reasons above as no further arguments were directed at this rejection.

5. Claims 6-25,46-53 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwayama et al. JP 60-122982 , in view of Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579, further in view of Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691.

Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981), teaches the formation of a intermediate (sub-master) hologram using a contact copying process. The reference angle can be varied in making the intermediate master. This may allow a higher quality sub-master to be formed. (page 1897). The use of a sub-master allows more final copy holograms to be formed. (page 1896).

Kuwayama et al. '691 teaches the formation of optical recording heads with correction for wavelength differences. (abstract). The intensity of the zero and first order beams should be the same (8/32-47).

To address embodiment bounded by the claims, but not disclosed/discussed above, the examiner cites Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691 and holds that it would have been obvious to one skilled

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in the art to modify the processes rendered obvious by the combination of Kuwayama et al. JP 60-122982 with Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579, by forming an intermediate master as taught by Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and using this to form the final articles, by contact copying, as this would allow plural copies to be made simultaneously (ie there could be plural production lines, rather than just one and the sub-masters can be made of higher quality and/or it would have been obvious to one skilled in the art to modify the processes rendered obvious by the combination of Kuwayama et al. JP 60-122982 with Tsuji et al. '017, Kuwayama et al. '158 and Sekine et al. '579, by equalizing the intensity of the reference (transmitted zero order) and object (diffracted first order) beams as taught by Kuwayama et al. '691 in the manufacture of diffractive optical heads as this is known as desirable in the art.

The rejection stands for the reasons above as no further arguments were directed at this rejection.

6. Claims 6-25, 46-53 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwayama et al. JP 60-122982, in view of Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579, further in view of Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691, further in view of Sutherland et al. '442.

Sutherland et al. '442 teaches the formation of contact copies using polymer dispersed liquid crystalline holograms, the use of these as masters in contact copying allow the intensity of the object (diffracted first order) and reference (zero order) to be balanced by controlling the diffraction efficiency of the master electrically. (abstract)

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To address embodiment bounded by the claims, but not disclosed/discussed above, the examiner cites Sutherland et al. '442 and holds that it would have been obvious to one skilled in the art to modify the processes rendered obvious by the combination of Kuwayama et al. JP 60-122982 with Ouchida et al. JP 2000-030285, Kuwayama et al. '158, Sekine et al. '579 combined with Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691 by using PDLC holograms as the master holograms to allow for easy adjustment of the relative intensities of the zero and first order beams the exposure of which produce the final copy.

The rejection stands for the reasons above as no further arguments were directed at this rejection.

7. Claims 6-25 and 46-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwayama et al. JP 60-122982, in view of Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579, further in view of Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691, further in view of Watanabe et al. '637.

Watanabe et al. '637 shows contact copying processes in figures 3 and 8a, which are disclosed as used with the mask of figure 9a to form the master shown in figure 9b, which is then used to form duplicates shown in figure 9c. Clearly to form the multiple holograms shown in figure 9b, from the single hologram shown in figure 9a, the medium or the mask would have to be stepped/translated in two directions.

To address embodiment bounded by the claims, but not disclosed/discussed above, the examiner cites Watanabe et al. '637 and holds that it would have been obvious to one skilled in

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the art to modify the processes rendered obvious by the combination of Kuwayama et al. JP 60-122982 with Ouchida et al. JP 2000-030285, Kuwayama et al. '158, Sekine et al. '579 combined with Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691 by forming an intermediate master having plural holographic patterns thereon from the initial master by performing multiple contact exposures with translation of the mask or the photosensitive material to as taught by Watanabe et al '637 to increase the number of holograms able to be produced in a single step.

The rejection stands for the reasons above as no further arguments were directed at this rejection.

8. Claims 6-53 and 58-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwayama et al. JP 60-122982 , in view of Ouchida et al. JP 2000-030285, Kuwayama et al. '158 and Sekine et al. '579, further in view of Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691, further in view of Satoh et al. '480.

Satoh et al. '480 teaches with respect to figure 5, an original hologram (70), which is separated from a holographic recording medium (84) by a first lens (76), an aperture which allows passage of only the zero And first order beams (80) and a second lens (82). The use of the light modulation coupled wit the motor spinning/translating the holographic recording medium provides copies of the original in different portions of the holographic recording medium.

To address embodiment bounded by the claims, but not disclosed/discussed above, the examiner cites Satoh et al. '480 and holds that it would have been obvious to one skilled in the

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art to modify the processes rendered obvious by the combination of Kuwayama et al. JP 60-122982 with Ouchida et al. JP 2000-030285, Kuwayama et al. '158, Sekine et al. '579 combined with Dickson et al., IBM Technical disclosure bulletin Vol. 24(4) pp. 1896-1897 (09/1981) and/or Kuwayama et al. '691 by using other old and well known holographic duplication methods, such as that of Satoh et al. '480 which allows multiple holograms to be recorded from a single master into different portions of the holographic recording media.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Funato et al. '047 see figures 2a and 2b, where the diffractive area is a square, rather than a circle.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin J Angebranndt/  
Primary Examiner, Art Unit 1795

Martin J Angebranndt  
Primary Examiner  
Art Unit 1795

2/20/2009